



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICIAL RECORD
HEALTH EFFECTS DIVISION
SCIENTIFIC DATA REVIEWS
EPA SERIES 361

January 16, 2002

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: **Ziram** (034805) Reregistration Case No. 2180. Revised Anticipated Residues, Acute, Chronic, and Cancer Dietary Exposure and Risk Analyses for the HED Human Health Risk Assessment. DP Barcode D280195.

FROM: Thurston G. Morton, Chemist
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Thurston G. Morton
1/16/02

THROUGH: Jennifer Tyler, Chemist
David Soderberg, Chemist
Dietary Exposure Science Advisory Council

Jennifer Tyler
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and

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TO: Sanjivani Diwan, Risk Assessor
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and

Pat Dobak/Betty Shackelford
Reregistration Branch 3
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Action Requested

Prepare the revised anticipated residues and acute, chronic, and cancer dietary exposure and risk analyses for ziram (034805) incorporating any applicable comments from the registrants (Ziram Task Force). These changes from the previous dietary exposure analysis (T. Morton, D277792, 9/13/01) including the recently submitted blueberry field trials and correcting the residue value for apples-dried. Ziram is a fungicide registered for use on a variety of fruit, nut, and vegetable crops. Only those uses listed on the use closure memorandum supported by the registrants and strawberries will be considered in these dietary exposure analyses.

Executive Summary

- Estimated acute dietary exposure exceeds HED's level of concern for All Infants and Children (1-6 years old) at the 99.9th percentile. The maximum dietary risk estimate is 175% of the aPAD for All Infants, 125% of the aPAD for Children (1-6 years old), and 66% of the aPAD for the U.S. Population. If the 0.15X reduction factor from the peach washing study is applied to all commodities (except nuts and berries) the maximum dietary risk estimate is 26% of the aPAD for All Infants, 57% of the aPAD for Children (1-6 years old), and 21% of the aPAD for the U.S. Population. When the required washing studies are submitted by the registrant, HED can better judge whether this assumption is correct.
- Estimated chronic dietary risks are below HED's level of concern for the U.S. Population and all population subgroups. The resulting risk estimates are 6% of the chronic PAD (% cPAD) for the U.S. Population, 26% of the cPAD for All Infants (the most highly exposed population subgroup), 18% of the cPAD for Children (1-6 years old), and 11% of the cPAD for Children (7-12 years old). The remaining population subgroups were $\leq 5\%$ of the cPAD.
- Estimated cancer dietary risk is above HED's level of concern. The resulting risk estimate is 2.0×10^{-5} for the U.S. Population when using field trials. When applying the 0.15X reduction factor from the peach washing study to all commodities (except nuts and berries) the resulting risk estimate is 3.4×10^{-6} for the U.S. Population. Risk drivers for the group U.S. Population were apples and pears. When the 0.15X washing factor was used in the dietary analysis, the risk drivers were apples and pears. When the required washing studies are submitted by the registrant, HED can better judge whether this assumption is correct.

Toxicological Information

Memoranda providing details of relevant toxicological information include the Hazard Identification Assessment Review Committee (HIARC) meeting of 9/6/01, the Food Quality Protection Act (FQPA) Safety Factor Committee meeting of 9/10/01, and the Cancer Assessment Review Committee report dated 4/6/00.

The acute FQPA safety factor was reduced to 3X for all populations. The chronic FQPA safety factor was reduced to 3X for all populations (FQPA Safety Factor meeting of 9/10/01). A reference dose (RfD) which includes the FQPA safety factor (10X, 3X or 1X) is defined as the Population Adjusted Dose (PAD). Toxicological doses and endpoints for dietary risk assessment are presented in Table 1.

Table 1. Ziram: Toxicological Doses and Endpoints for Dietary Risk Assessment.

EXPOSURE SCENARIO	DOSE (mg/kg/day)	ENDPOINT	STUDY
Acute Dietary (Gen. Population)	LOAEL = 15 UF = 300 FQPA = 3X	Ataxia and slight impairment of gait.	Acute Oral Neurotoxicity / Rat
		Acute RfD (Gen. Population) = 0.05 mg/kg/day Acute Population Adjusted Dose (aPAD) = 0.017 mg/kg/day	
Chronic Dietary	NOAEL = 1.6 UF = 100 FQPA = 3X	Decreased body weight gain.	Chronic Oral Toxicity / Dog
		Chronic RfD = 0.016 mg/kg/day Chronic Population Adjusted Dose (cPAD) = 0.005 mg/kg/day	
Cancer	$Q_1^* = 6.11 \times 10^{-2}$ (mg/kg/day) ⁻¹	Increase in the incidence of male rat thyroid c-cell adenoma and/or carcinoma.	

Consumption Data

HED conducts dietary risk assessments using the Dietary Exposure Evaluation Model (DEEM™), which incorporates consumption data generated in USDA's Continuing Surveys of Food Intakes by Individuals (CSFII), 1989-1992. For acute dietary risk assessments, the entire distribution of single day food consumption events is combined with either a single residue level (deterministic analysis, risk at 95th percentile of exposure reported) or a distribution of residues (probabilistic analysis, referred to as "Monte Carlo," with risk at 99.9th percentile of exposure reported) to obtain a distribution of exposures in mg/kg/day. For chronic dietary risk assessments, the three-day average of consumption for each sub-population is combined with average residues in/on commodities to determine an average exposure in mg/kg/day.

Residue Information

Tolerances for residues of ziram in/on food and feed commodities are currently established under 40 CFR §180.116 and are expressed in terms of ziram (zinc dimethyldithiocarbamate), calculated as zinc ethylenebisdithiocarbamate. The nature of the residue in plants and ruminants is not adequately understood. The HED Metabolism Assessment Review Committee (G. Otakie, 12/16/99, D261844) concluded that there was no objection to RRB4 proceeding with preparation of the subject REDS and risk assessments in light of the fact that the nature of the residue in plants and animals is not adequately understood. The current common moiety plant method (i.e. everything converted to CS₂) would likely include the residues of the metabolites of toxicological concern. Potential residues in secondary livestock commodities would be estimated as the parent from the TRR levels in livestock tissues. The anticipated residues (ARs) were presented to the HED ChemSAC on 7/25/01. The Biological and Economic Analysis Division (OPP/BEAD) provided updated usage information for ziram (I. Yusuf, 6/27/01). The usage data are provided as Attachment 1; inclusion of the data in dietary exposure analyses is discussed below.

Processing studies for apple, grape, and tomato have been submitted by the registrant and found adequate. Ziram residues did concentrate in the raisin fraction (2X). Ziram residues did not concentrate in the apple juice fraction (0.1X), tomato paste (0.5X), or tomato puree (0.3X). The apple juice concentration factor of 0.1X was translated to pear juice and the tomato paste concentration factor of 0.5X was translated to tomato ketchup. DEEM™ default concentrations factors (adjustment factor 1) will be used for all other concentration factors. A peach washing study (G. Otakie, 7/26/01, D276038) was submitted by the registrant which showed a reduction factor of 0.15X. HED has recommended the registrant conduct additional washing studies on other commodities. However, HED conducted an acute and cancer dietary analysis using a reduction factor of 0.15X for all commodities except nuts and berries to determine what the exposure estimate would be if all commodity washing studies showed a similar reduction in ziram residues from washing. Residue values from the ziram field trials were corrected for storage stability except for tomatoes which were analyzed within 1 month of harvest.

FDA monitoring data from 1992-1999 were available for the EBDC class of pesticides for the following commodities: apples, pears, peaches, nectarines, tomatoes, and several of the small berries. The EBDC analytical method would determine ziram residues along with a number of other pesticides due to the common moiety analytical method which the FDA utilizes. However, all commodities had less than 100 samples which were monitored for ziram except for tomato. It is the policy of HED not to use monitoring data with less than 100 samples. Since tomatoes were not a risk driver in the dietary analyses the tomato FDA data were not used either.

Almonds

BEAD estimates average % crop treated (CT) and maximum % CT of 20% and 44% CT for almonds. Field trial data were used for almonds from MRID 41153106. All food forms of almonds are considered to be partially blended. There were 47 residue values incorporated into a residue distribution file (RDF) for almonds. An average ziram residue point estimate of 0.032 ppm was used for the chronic analysis for all food forms.

Apples

BEAD estimates average % crop treated (CT) and maximum % CT of 14% and 25% CT for apples. Field trial data were used for apples from MRIDs 41229802 and 43282501. Apple food forms include non-blended (uncooked, cooked, baked, boiled, and fried), partially blended (juice, canned), and blended (dried apples) food forms. There were 14 residue values incorporated into an RDF for the acute probabilistic analysis (non-blended and partially blended food forms), an average residue point estimate of 2.62 ppm for the acute analysis (blended food forms), and an average residue point estimate of 2.62 ppm for the chronic analysis (all food forms). Ziram residues did not concentrate in the apple juice fraction (0.1X) (C. Swartz, 6/15/93, D182885).

Apricots

BEAD estimates average % crop treated (CT) and maximum % CT of 19% and 34% CT for apricots. Field trial data were used for apricots from MRIDs 41153101 and 43282502. Apricot food forms include non-blended (uncooked, cooked, and boiled) and partially blended (juice, canned and dried) food forms. There were 13 residue values incorporated into an RDF for the acute probabilistic analysis (non-blended and partially blended food forms) and average residue point estimate of 7.94 ppm was used for the chronic analysis (all food forms).

Blueberries

BEAD estimates average % crop treated (CT) and maximum % CT of 12% and 26% CT for blueberries. Field trial data were used for cherries from MRID 45512001 and 45534501. All blueberry food forms are partially blended. There were 29 residue values incorporated into an RDF for the acute probabilistic analysis and average residue point estimate of 2.43 ppm was used for the chronic analysis (all food forms).

Cherries

BEAD estimates average % crop treated (CT) and maximum % CT of 1% and 4% CT for cherries. Field trial data were used for cherries from MRID 41153103. All cherry food forms are partially blended. There were 11 residue values incorporated into an RDF for the acute probabilistic analysis and average residue point estimate of 2.71 ppm was used for the chronic analysis (all food forms).

Grapes

BEAD estimates average % crop treated (CT) and maximum % CT of 2% and 4% CT for grapes. Field trial data were used for grapes from MRIDs 44914102 and 44914103. All grape food forms are partially blended. There were 21 residue values incorporated into an RDF for the acute probabilistic analysis and average residue point estimate of 2.64 ppm was used for the chronic analysis (all food forms). Ziram residues did concentrate in the raisin fraction (2X) (G. Otakie, 7/24/01, D276470).

Nectarines

BEAD estimates average % crop treated (CT) and maximum % CT of 15% and 21% CT for nectarines. Field trial data were used for nectarines from MRID 41229801. All nectarine food forms are non-blended. There were 10 residue values incorporated into an RDF for the acute probabilistic analysis and average residue point estimate of 0.84 ppm was used for the chronic analysis (all food forms).

Peaches

BEAD estimates average % crop treated (CT) and maximum % CT of 10% and 20% CT for peaches. Field trial data were used for peaches from MRID 41153104. Peach food forms include non-blended (uncooked, cooked, baked, and boiled) and partially blended (juice, canned, frozen, and dried) food forms. There were 15 residue values incorporated into a RDF for the acute probabilistic analysis (non-blended and partially blended food forms) and average residue point estimate of 1.06 ppm was used for the chronic analysis (all food forms).

Pears

BEAD estimates average % crop treated (CT) and maximum % CT of 26% and 49% CT for pears. Field trial data were used for pears from MRID 41153102. Pear food forms include non-blended (uncooked, cooked, baked, and boiled) and partially blended (juice, canned, and dried) food forms. There were 14 residue values incorporated into an RDF for the acute probabilistic analysis (non-blended and partially blended food forms) and average residue point estimate of 2.69 ppm was used for the chronic analysis (all food forms).

Pecans

BEAD estimates average % crop treated (CT) and maximum % CT of 3% and 8% CT for pecans. Field trial data were used for pecans from MRID 41229803. All food forms of pecans are considered to be partially blended. There were 6 residue values incorporated into an RDF for the acute probabilistic analysis and average residue point estimate of 0.033 ppm was used for the chronic analysis. Three of these residue values came from trials conducted with a flowable concentrate formulation which is canceled. However, the residues were similar to the residues from the wettable powder and water dispersible granule field trials.

Tomatoes

BEAD estimates average % crop treated (CT) and maximum % CT of <1% and 1 % CT for tomatoes. Field trial data were used for tomatoes from MRIDs 44898603 and 45272901. Tomato food forms include non-blended (whole-uncooked, cooked, baked, fried, and boiled) and partially blended (paste, puree, catsup, dried, juice, and whole-canned, frozen) food forms. There were 17 residue values incorporated into an RDF for the acute probabilistic analysis (non-blended and partially blended food forms) and average residue point estimate of 0.65 ppm was used for the chronic analysis (all food forms). Ziram residues did not concentrate in tomato paste (0.5X), or tomato puree (0.3X) (G. Otakie, 6/21/01, D258972). The tomato paste concentration factor of 0.5X was translated to tomato ketchup.

Table 2. Summary of Ziram Residue Information and Dietary Exposure Analyses Input.

Commodity/Reassessed Tolerance (ppm)	% Crop Treated Ave. Max.	Data Source	Commodity Classification	Food Forms	Acute Residue Distribution File (RDF)	Acute AR (%CT not inc.)	Chronic AR (%CT not inc.)
Almonds/0.1	20 44	FT	PB	All food forms	47NZ, 60Z	NA	0.032
Apples/6	14 25	FT	NB	Uncooked, cooked, baked, boiled, fried	14NZ, 42Z	NA	2.62
			PB	Juice, canned	14NZ, 42Z	NA	2.62
			B	Dried	NA	2.62	2.62
Apricots/20	19 34	FT	NB	Uncooked, cooked, boiled	13NZ, 25Z	NA	7.94
			PB	Juice, canned, dried	13NZ, 25Z	NA	7.94
Blueberries/7	26 12	FT	PB	All food forms	29NZ, 83Z	NA	2.43
Cherries/6	1 4	FT	PB	All food forms	11NZ, 264Z	NA	2.71
Grapes/TBD	2 4	FT	PB	All food forms	21NZ, 504Z	NA	2.64
Nectarines/7	15 21	FT	NB	Uncooked	10NZ, 38Z	NA	0.84
Peaches/7	10 20	FT	NB	Uncooked, cooked, baked, boiled	15NZ, 60Z	NA	1.06
			PB	Juice, canned, frozen, dried	15NZ, 60Z	NA	1.06
Pears/6	10 20	FT	NB	Uncooked, cooked, baked, boiled	14NZ, 15Z	NA	2.69
			PB	Juice, canned, dried	14NZ, 15Z	NA	2.69
Pecans/0.1	3 8	FT	PB	All food forms	6NZ, 69Z	NA	0.033
Tomatoes/TBD	1 1	FT	NB	Whole-uncooked, cooked, baked, fried, boiled	17NZ, 1683Z	NA	0.65

			PB		Paste, puree, catsup, dried, juice, whole- canned	17NZ, 1683Z	NA	0.65
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Uncertainties

There are no adequate nature of the residue studies for plants or ruminants. The HED MARC has concluded that the current enforcement method (CS_2 generation) will most likely detect any residues of concern. However, additional identification was required by HED. Residues in meat and milk are estimated to be zero at this time until additional metabolism data are submitted. The only animal feed items are almond hulls and wet apple pomace. Almond hulls would most likely be available for a cattle feed item in only several western states so the predominant feed item would be wet apple pomace. If the washing factor of 0.15X is applied to wet apple pomace the dietary burden for beef cattle would be 0.6 ppm. Therefore, the ruminant metabolism study would have been performed at a 500X exaggerated rate. Using the metabolism study, the only tissue which may have detectable residues would be cattle liver at a level slightly above the detection limit if the entire TRR is used. Therefore, HED assumed the residues in meat and milk were zero.

No field trial residue data are available for strawberry and blackberry, therefore, tolerances were used in the dietary exposure analyses for these commodities. In addition, some commodities had a limited number of field trial residue values. However, the dietary analysis most likely represents an upperbound risk estimate for ziram.

The dietary exposure analyses is a somewhat refined Tier 3 assessment since percent crop treated and field trial residues were used in the analyses. A processing study was available for apples (translated to pears), grapes, and tomatoes only; the default DEEM™ processing factors were used for all other foods. Several dried fruits (dried apricots, apples, and pears) were risk drivers for Females 13-50 years old in the acute dietary exposure analyses. Default DEEM™ processing factors were used for these dried fruit. The concentration factor for raisin was 2X which is approximately 50% of the default DEEM™ processing factor. If processing studies were conducted on dried apricots, dried apples, dried pears, dried peaches, and dried tomatoes a similar reduction in the processing factor factor used might be shown. A peach washing study was submitted by the registrant which showed a reduction factor of 0.15X. HED has recommended the registrant conduct additional washing studies on other commodities. However, HED conducted an acute and cancer dietary analysis using a reduction factor of 0.15X for all commodities except nuts and berries to determine what the exposure estimate would be if all commodity washing studies showed a similar reduction in ziram residues from washing. When the required washing studies are submitted by the registrant, HED can better judge whether this assumption is correct.

Results/Discussion

HED notes that there is a degree of uncertainty in extrapolating exposures for certain population subgroups which may not be sufficiently represented in the consumption surveys, (e.g., nursing and non-nursing infants or Hispanic females). Therefore, risks estimated for these population subgroups were included in representative populations having sufficient numbers of survey respondents (e.g., all infants or females, 13-50 years old).

Estimated acute dietary exposure exceeds HED's level of concern for All Infants and Children (1-6 years old) at the 99.9th percentile. The maximum dietary risk estimate is 175% of the aPAD for All Infants, 125% of the aPAD for Children (1-6 years old), and 66% of the aPAD for the U.S. Population. If the 0.15X reduction factor from the peach washing study is applied to all commodities (except nuts and berries) the maximum dietary risk estimate is 26% of the aPAD for All Infants, 57% of the aPAD for Children (1-6 years old), and 21% of the aPAD for the U.S. Population. Risk drivers for the subgroup All Infants were canned pears, canned apples, canned apricots, uncooked pears, and canned peaches. Risk drivers for the subgroup Children 1-6 years old were uncooked pears, boiled apples, dried apricots, and uncooked apples. When the 0.15X washing factor was used in the dietary analysis, the risk drivers remained the same for the subgroup All Infants. When the 0.15X washing factor was used in the dietary analysis, the risk drivers were uncooked strawberries and uncooked pears for the subgroup Children 1-6 years old.

Estimated chronic dietary risks are below HED's level of concern for the U.S. Population and all population subgroups. The resulting risk estimates are 6% of the chronic PAD (% cPAD) for the U.S. Population, 26% of the cPAD for All Infants (the most highly exposed population subgroup), 18% of the cPAD for Children (1-6 years old), and 11% of the cPAD for Children (7-12 years old). The remaining population subgroups were $\leq 5\%$ of the cPAD.

Estimated cancer dietary risk is above HED's level of concern. The resulting risk estimate is 2.0×10^{-5} for the U.S. Population when using field trials. When applying the 0.15X reduction factor from the peach washing study to all commodities (except nuts and berries) the resulting risk estimate is 3.4×10^{-6} for the U.S. Population. Risk drivers for the group U.S. Population were apples and pears. When the 0.15X washing factor was used in the dietary analysis, the risk drivers were apples and pears.

Table 3. Estimated Acute, Chronic, and Cancer Dietary Exposure and Risk for Ziram using field trials.

Population Subgroup	Acute (99.9th %-ile)		Chronic		Cancer	
	Exposure (mg/kg/day)	%aPAD	Exposure (mg/kg/day)	% cPAD	Exposure (mg/kg/day)	Lifetime Risk
U.S. Population	0.011195	66	0.000324	6	0.000324	2.0 X 10 ⁻⁵
All infants (<1 yr)	0.029676	175	0.001379	26	NA	NA
Children (1-6 yrs)	0.021255	125	0.000936	18	NA	NA
Children (7-12 yrs)	0.012288	72	0.000567	11	NA	NA
Females (13-50 yrs)	0.006020	35	0.000188	4	NA	NA
Males (13-19 yrs)	0.004768	28	0.000158	3	NA	NA
Males (20+ yrs)	0.005708	34	0.000190	4	NA	NA
Seniors (55+ yrs)	0.007160	42	0.000281	5	NA	NA

Table 4. Estimated Acute, Chronic, and Cancer Dietary Exposure and Risk for Ziram using field trials and applying the 0.15x reduction factor from the peach washing study to all commodities except nuts and berries.

Population Subgroup	Acute (99.9th %-ile)		Cancer	
	Exposure (mg/kg/day)	%aPAD	Exposure (mg/kg/day)	Lifetime Risk
U.S. Population	0.002457	14	0.000055	3.4 X 10 ⁻⁶
All infants (<1 yr)	0.004456	26		
Children (1-6 yrs)	0.009689	57		
Children (7-12 yrs)	0.003596	21		
Females (13-50 yrs)	0.001744	10		
Males (13-19 yrs)	0.001201	7		
Males (20+ yrs)	0.001557	9		
Seniors (55+ yrs)	0.001770	10		

cc : Chem F, Chron F. Morton , L. Richardson

RDI:Chemistry SAC (7/25/01); DE SAC (7/26/01) (J. Tyler, 1/16/02 & D. Soderberg, 1/16/02); SVH:1/16/02

TM, Thurston Morton, Rm. 816D CM2, 305-6691, mail code 7509C

List of Attachments:

- Attachment 1: Quantitative Usage Analysis, 6/27/01 (I. Yusuf, BEAD/OPP).
- Attachment 2: Residue Distribution Files.
- Attachment 3: Residue Information.
- Attachment 4: Acute Analysis.
- Attachment 5: Chronic Analysis.
- Attachment 6: Cancer Analysis.
- Attachment 7: Acute Critical Commodity Contribution Analysis.
- Attachment 8: Chronic Critical Commodity Contribution Analysis.
- Attachment 9: Cancer Critical Commodity Contribution Analysis.

Attachment 1: Quantitative Usage Analysis, 6/27/01 (I. Yusuf, BEAD/OPP).

Site	Acres Grown (000)	Acres Treated (000)		% of Crop Treated		LB AI Applied (000)		Average Application Rate			States of Most Usage
		Wtd Avg	Est Max	Wtd Avg	Est Max	Wtd Avg	Est Max	lb ai/ acre/yr	#appl / yr	lb ai/ A/appl	(% of total lb ai used on this site)
Blueberries	59	7	15	12%	26%	30	61	4.1	1.9	2.2	MI NJ 100%
Strawberries	48	0	3	1%	5%	1	8	3.0	1.0	3.0	NY PA 92%
Apples	520	71	132	14%	25%	550	1,014	7.7	2.5	3.1	WA NC PA VA WV MI 85%
Pears	74	19	36	26%	49%	140	267	7.4	1.6	4.6	CA OR WA 96%
Nectarines	36	5	7	15%	21%	36	50	6.6	1.2	5.4	CA
Apricots	21	4	7	19%	34%	30	63	7.7	1.6	4.9	CA FL
Cherries	114	2	4	1%	4%	10	36	6.5	2.3	2.9	OR MI 100%
Peaches	259	25	53	10%	20%	160	317	6.5	1.3	4.9	CA 86%
Grapes	615	10	25	2%	4%	33	86	3.5	1.6	2.2	WI PA
Almonds	489	100	215	20%	44%	660	1226	6.6	1.2	5.4	CA 100%
Pecans	452	12	36	3%	8%	93	274	7.9	2.0	4.0	TX GA OK 88%
Walnuts	215	1	5	1%	2%	9	38	6.4	1.5	4.4	CA 100%
Tomatoes	477	1	4	0%	1%	5	13	3.4	1.5	2.3	OH 100%
Nursery and greenhouse	371	4	8	1%	2%	1	3	-	-	-	
LCOS' and LMCS'	4,000	4	6	0%	0%	30	46	-	-	-	
Total		266	411			1,789	2,645				

COLUMN HEADINGS

Wtd Avg = Weighted average--the most recent years and more reliable data are weighted more heavily.

Est Max = Estimated maximum, which is estimated from available data.

Average application rates are calculated from the weighted averages.

NOTES ON TABLE DATA

Usage data primarily covers 1987 - 1997. Calculations of the above numbers may not appear to agree because they are displayed as rounded to the nearest 1000 for acres treated or lb. a.i. (Therefore 0 = < 500)

to the nearest whole percentage point for % of crop treated. (Therefore 0% = < 0.5%)

0* = Available EPA sources indicate that no usage is observed in the reported data for this site, which implies that there is little or no usage.

A dash (-) indicates that information on this site is NOT available in EPA sources or is insufficient.

Ziram was registered for use on strawberries in Massachusetts only until canceled in 1990.

SOURCES: EPA data, 1987-97; USDA, and National Center for Food and Agricultural Policy

Attachment 2: RDFs

ALMONDS
%CPTX=44
TOTALZ=60
TOTALNZ=47

0.03

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0.065

0.066

APPLES
%CPTX=25
TOTALZ=42
TOTALNZ=14

0.25

0.23

0.29

2.84

2.26

2.25

2.52

0.88

4.38

5.55
3.78
5.44
5.24
0.83

APRICOTS
%CPTX=34
TOTALZ=25
TOTALNZ=13
15.9
17.7
12.3
12.0
11.3
2.67
1.85
9.28
2.95
3.27
4.60
4.32
5.07

CHERRIES
%CPTX=4
TOTALZ=264
TOTALNZ=11
3.16
3.38
4.28
5.52
2.46
3.82
0.5
0.9
0.954
0.806
4.08

GRAPES
%CPTX=4
TOTALZ=504
TOTALNZ=21
0.3
0.65
6.15
6.54
0.58
1.09
1.64
1.95
1.87
2.39
1.87
2.28
0.417
0.802
4.18
4.89
6.24
7.02
3.62
0.785
0.177

NECTARINES
%CPTX=21
TOTALZ=38
TOTALNZ=10
3.3
2.63
0.114
0.276
0.213
0.339
0.193
0.217
0.564
0.511

PEACHES
%CPTX=20
TOTALZ=60
TOTALNZ=15
1.24
6.61
1.4
1.28
1.21
1.44
0.018
0.018
0.137
0.018
2.07
0.203
0.109
0.083
0.077

PEARS
%CPTX=49
TOTALZ=15
TOTALNZ=14
1.21
2.4
2.7
1.77
5.27
3.16
2.49
3.09
1.51
1.93
1.4
1.83
5.66
3.3

PECANS
%CPTX=8
TOTALZ=69
TOTALNZ=6
0.025
0.025
0.025
0.025
0.07
0.025

TOMATOES
%CPTX=1
TOTALZ=1683
TOTALNZ=17
0.228
0.505
0.443
0.572
1.30
1.21
0.262
0.25
0.70
0.125
0.125
1.03
0.95
0.183
0.178
1.08
1.89

BLUEBERRIES
%CPTX=26
TOTALZ=83
TOTALNZ=29
2.5
1.9
0.13
2.2
2.2
3.8
4.1
.81
2.5
4.0
5.8
4.44
3.55
3.18
2.74
1.1
1.06
1.0
1.02
2.8
2.88
1.46
1.09
1.04
1.12
1.52
1.61
3.82
5.22

Attachment 3: Residue Information

Acute Analysis: Using Field Trials

Filename: C:\deem\034805\Revised Analysis\1-10-02acutefieldtrials.RS7

Chemical: Ziram

RfD(Chronic): 0 mg/kg bw/day NOEL(Chronic): 0 mg/kg bw/day

RfD(Acute): 0 mg/kg bw/day NOEL(Acute): 0 mg/kg bw/day

Date created/last modified: 01-10-2002/13:28:39/8

Program ver. 7.75

Comment: Acute dietary analysis with field trials, processing factors, and % CT.

RDL indices and parameters for Monte Carlo Analysis:

Index Dist Parameter #1 Param #2 Param #3

Code

1	6	almonds.rdf
2	6	apples.rdf
3	6	apricots.rdf
4	6	cherries.rdf
5	6	grapes.rdf
6	6	nectarines.rdf
7	6	peaches.rdf
8	6	pears.rdf
9	6	pecans.rdf
10	6	tomatoes.rdf
11	6	blueberry.rdf

Food Code	Crop Grp	Food Name	Def Res (ppm)	Adj. Factors #1	Adj. Factors #2	RDL Pntr
40	14	Almonds	0.032000	1.000	0.620	1
52	11	Apples	2.620000	1.000	0.220	2
53	11	Apples-dried	2.620000	8.000	0.250	
54	11	Apples-juice/cider	2.620000	0.100	0.220	2
377	11	Apples-juice-concentrate	2.620000	0.300	0.220	2
410	12	Apricot juice	7.940000	1.000	0.230	3
59	12	Apricots	7.940000	1.000	0.230	3
60	12	Apricots-dried	7.940000	6.000	0.230	3
1	13A	Blackberries	7.000000	1.000	0.010	
380	13A	Blackberries-juice	7.000000	1.000	0.010	
7	13B	Blueberries	2.430000	1.000	0.260	11
61	12	Cherries	2.710000	1.000	0.060	4
62	12	Cherries-dried	2.710000	4.000	0.060	4
63	12	Cherries-juice	2.710000	1.500	0.060	4
13	0	Grapes	2.640000	1.000	0.040	5
15	0	Grapes-juice	2.640000	1.200	0.040	5
392	0	Grapes-juice-concentrate	2.640000	3.600	0.040	5
195	0	Grapes-leaves	2.640000	1.000	0.040	5
14	0	Grapes-raisins	2.640000	2.000	0.040	5
315	0	Grapes-wine and sherry	2.640000	1.000	0.040	5
64	12	Nectarines	0.840000	1.000	0.330	6
65	12	Peaches	1.060000	1.000	0.270	7
66	12	Peaches-dried	1.060000	7.000	0.270	7
402	12	Peaches-juice	1.060000	1.000	0.270	7
56	11	Pears	2.690000	1.000	0.370	8
57	11	Pears-dried	2.690000	6.250	0.370	8
404	11	Pears-juice	2.690000	0.100	0.370	8
47	14	Pecans	0.033000	1.000	0.200	9
17	0	Strawberries	7.000000	1.000	0.050	
416	0	Strawberries-juice	7.000000	1.000	0.050	
163	8	Tomatoes-catsup	0.650000	0.500	1.000	10
423	8	Tomatoes-dried	0.650000	14.300	1.000	10
160	8	Tomatoes-juice	0.650000	1.500	1.000	10
162	8	Tomatoes-paste	0.650000	0.500	1.000	10
161	8	Tomatoes-puree	0.650000	0.300	1.000	10
159	8	Tomatoes-whole	0.650000	1.000	1.000	10

Acute Analysis: Using Field Trials and adding 0.15X reduction factor during washing

Filename: C:\deem\034805\Revised Analysis\1-10-02acutefieldtrialswithwashfactor.RS7

Chemical: Ziram

RfD(Chronic): 0 mg/kg bw/day NOEL(Chronic): 0 mg/kg bw/day

RfD(Acute): 0 mg/kg bw/day NOEL(Acute): 0 mg/kg bw/day

Date created/last modified: 01-02-2002/09:14:31/8

Program ver. 7.75

Comment: Acute dietary analysis with field trials, processing factors, % CT, and the 0.15X peach washing factor used for all commodities except berries and nuts.

RDL indices and parameters for Monte Carlo Analysis:

Index Dist Parameter #1

Param #2 Param #3

Code

```

1 6 almonds.rdf
2 6 apples.rdf
3 6 apricots.rdf
4 6 cherries.rdf
5 6 grapes.rdf
6 6 nectarines.rdf
7 6 peaches.rdf
8 6 pears.rdf
9 6 pecans.rdf
10 6 tomatoes.rdf
11 6 blueberry.rdf

```

Food Code	Crop Grp	Food Name	Def Res (ppm)	Adj.Factors #1	Adj.Factors #2	RDL Pntr
40	14	Almonds	0.032000	1.000	0.620	1
52	11	Apples	2.620000	0.150	0.220	2
53	11	Apples-dried	2.620000	1.200	0.250	
54	11	Apples-juice/cider	2.620000	0.015	0.220	2
377	11	Apples-juice-concentrate	2.620000	0.045	0.220	2
410	12	Apricot juice	7.940000	0.150	0.230	3
59	12	Apricots	7.940000	0.150	0.230	3
60	12	Apricots-dried	7.940000	0.900	0.230	3
1	13A	Blackberries	7.000000	1.000	0.010	
380	13A	Blackberries-juice	7.000000	1.000	0.010	
7	13B	Blueberries	2.430000	1.000	0.260	11
61	12	Cherries	2.710000	0.150	0.060	4
62	12	Cherries-dried	2.710000	0.600	0.060	4
63	12	Cherries-juice	2.710000	0.230	0.060	4
13	0	Grapes	2.640000	0.150	0.040	5
15	0	Grapes-juice	2.640000	0.180	0.040	5
392	0	Grapes-juice-concentrate	2.640000	0.540	0.040	5
195	0	Grapes-leaves	2.640000	1.000	0.040	5
14	0	Grapes-raisins	2.640000	0.300	0.040	5
315	0	Grapes-wine and sherry	2.640000	0.150	0.040	5
64	12	Nectarines	0.840000	0.150	0.330	6
65	12	Peaches	1.060000	0.150	0.270	7
66	12	Peaches-dried	1.060000	1.050	0.270	7
402	12	Peaches-juice	1.060000	0.150	0.270	7
56	11	Pears	2.690000	0.150	0.370	8
57	11	Pears-dried	2.690000	0.940	0.370	8
404	11	Pears-juice	2.690000	0.015	0.370	8
47	14	Pecans	0.033000	1.000	0.200	9
17	0	Strawberries	7.000000	1.000	0.050	
416	0	Strawberries-juice	7.000000	1.000	0.050	
163	8	Tomatoes-catsup	0.650000	0.080	1.000	10
423	8	Tomatoes-dried	0.650000	2.150	1.000	10
160	8	Tomatoes-juice	0.650000	0.230	1.000	10
162	8	Tomatoes-paste	0.650000	0.080	1.000	10
161	8	Tomatoes-puree	0.650000	0.050	1.000	10
159	8	Tomatoes-whole	0.650000	0.150	1.000	10

Chronic Analysis

Filename: C:\deem\034805\Revised Analysis\1-10-02chronicfieldtrials.RS7

Chemical: Ziram

RfD(Chronic): .0053 mg/kg bw/day NOEL(Chronic): 0 mg/kg bw/day

RfD(Acute): 0 mg/kg bw/day NOEL(Acute): 0 mg/kg bw/day

Date created/last modified: 01-02-2002/09:16:37/8

Program ver. 7.75

Comment: Chronic dietary analysis with field trials and % CT.

RDL indices and parameters for Monte Carlo Analysis:

Index #	Dist Code	Parameter #1	Param #2	Param #3
---------	-----------	--------------	----------	----------

1	6	almonds.rdf		
2	6	apples.rdf		
3	6	apricots.rdf		
4	6	cherries.rdf		
5	6	grapes.rdf		
6	6	nectarines.rdf		
7	6	peaches.rdf		
8	6	pears.rdf		
9	6	pecans.rdf		
10	6	tomatoes.rdf		

Note: No residue distributions have been assigned to RAC/FoodForms below

Food Code	Crop Grp	Food Name	Def Res (ppm)	Adj. Factors #1	#2
40	14	Almonds	0.032000	1.000	0.200
52	11	Apples	2.620000	1.000	0.140
53	11	Apples-dried	2.620000	8.000	0.140
54	11	Apples-juice/cider	2.620000	0.100	0.140
377	11	Apples-juice-concentrate	2.620000	0.300	0.140
410	12	Apricot juice	7.940000	1.000	0.190
59	12	Apricots	7.940000	1.000	0.190
60	12	Apricots-dried	7.940000	6.000	0.190
1	13A	Blackberries	7.000000	1.000	0.010
380	13A	Blackberries-juice	7.000000	1.000	0.010
7	13B	Blueberries	2.430000	1.000	0.120
61	12	Cherries	2.710000	1.000	0.010
62	12	Cherries-dried	2.710000	4.000	0.010
63	12	Cherries-juice	2.710000	1.500	0.010
13	0	Grapes	2.640000	1.000	0.020
15	0	Grapes-juice	2.640000	1.200	0.020
392	0	Grapes-juice-concentrate	2.640000	3.600	0.020
195	0	Grapes-leaves	2.640000	1.000	0.020
14	0	Grapes-raisins	2.640000	2.000	0.020
315	0	Grapes-wine and sherry	2.640000	1.000	0.020
64	12	Nectarines	0.840000	1.000	0.150
65	12	Peaches	1.060000	1.000	0.100
66	12	Peaches-dried	1.060000	7.000	0.100
402	12	Peaches-juice	1.060000	1.000	0.100
56	11	Pears	2.690000	1.000	0.260
57	11	Pears-dried	2.690000	6.250	0.260
404	11	Pears-juice	2.690000	0.100	0.260
47	14	Pecans	0.033000	1.000	0.030
17	0	Strawberries	7.000000	1.000	0.010
416	0	Strawberries-juice	7.000000	1.000	0.010
163	8	Tomatoes-catsup	0.650000	0.500	0.010
423	8	Tomatoes-dried	0.650000	14.300	0.010
160	8	Tomatoes-juice	0.650000	1.500	0.010
162	8	Tomatoes-paste	0.650000	0.500	0.010
161	8	Tomatoes-puree	0.650000	0.300	0.010
159	8	Tomatoes-whole	0.650000	1.000	0.010

Cancer Analysis with field trials

Filename: C:\deem\034805\Revised Analysis\1-10-02cancerfieldtrials.RS7

Chemical: Ziram

RfD(Chronic): 0 mg/kg bw/day NOEL(Chronic): 0 mg/kg bw/day

RfD(Acute): 0 mg/kg bw/day NOEL(Acute): 0 mg/kg bw/day Q* = .0611

Date created/last modified: 01-02-2002/09:15:20/8

Program ver. 7.75

Comment: Cancer dietary analysis with field trials and % CT.

RDL indices and parameters for Monte Carlo Analysis:

Index Dist Parameter #1 Param #2 Param #3

Code

1	6	almonds.rdf
2	6	apples.rdf
3	6	apricots.rdf
4	6	cherries.rdf
5	6	grapes.rdf
6	6	nectarines.rdf
7	6	peaches.rdf
8	6	pears.rdf
9	6	pecans.rdf
10	6	tomatoes.rdf

Note: No residue distributions have been assigned to RAC/FoodForms below

Food Code	Crop Grp	Food Name	Def Res (ppm)	Adj. Factors #1	Adj. Factors #2
40	14	Almonds	0.032000	1.000	0.200
52	11	Apples	2.620000	1.000	0.140
53	11	Apples-dried	2.620000	8.000	0.140
54	11	Apples-juice/cider	2.620000	0.100	0.140
377	11	Apples-juice-concentrate	2.620000	0.300	0.140
410	12	Apricot juice	7.940000	1.000	0.190
59	12	Apricots	7.940000	1.000	0.190
60	12	Apricots-dried	7.940000	6.000	0.190
1	13A	Blackberries	7.000000	1.000	0.010
380	13A	Blackberries-juice	7.000000	1.000	0.010
7	13B	Blueberries	2.430000	1.000	0.120
61	12	Cherries	2.710000	1.000	0.010
62	12	Cherries-dried	2.710000	4.000	0.010
63	12	Cherries-juice	2.710000	1.500	0.010
13	0	Grapes	2.640000	1.000	0.020
15	0	Grapes-juice	2.640000	1.200	0.020
392	0	Grapes-juice-concentrate	2.640000	3.600	0.020
195	0	Grapes-leaves	2.640000	1.000	0.020
14	0	Grapes-raisins	2.640000	2.000	0.020
315	0	Grapes-wine and sherry	2.640000	1.000	0.020
64	12	Nectarines	0.840000	1.000	0.150
65	12	Peaches	1.060000	1.000	0.100
66	12	Peaches-dried	1.060000	7.000	0.100
402	12	Peaches-juice	1.060000	1.000	0.100
56	11	Pears	2.690000	1.000	0.260
57	11	Pears-dried	2.690000	6.250	0.260
404	11	Pears-juice	2.690000	0.100	0.260
47	14	Pecans	0.033000	1.000	0.030
17	0	Strawberries	7.000000	1.000	0.010
416	0	Strawberries-juice	7.000000	1.000	0.010
163	8	Tomatoes-catsup	0.650000	0.500	0.010
423	8	Tomatoes-dried	0.650000	14.300	0.010
160	8	Tomatoes-juice	0.650000	1.500	0.010
162	8	Tomatoes-paste	0.650000	0.500	0.010
161	8	Tomatoes-puree	0.650000	0.300	0.010
159	8	Tomatoes-whole	0.650000	1.000	0.010

Cancer Analysis with field trials and adding a 0.15X reduction factor for washing

Filename: C:\deem\034805\Revised Analysis\1-10-02cancerfieldtrialswithwashfactor.RS7
 Chemical: Ziram
 RfD(Chronic): 0 mg/kg bw/day NOEL(Chronic): 0 mg/kg bw/day
 RfD(Acute): 0 mg/kg bw/day NOEL(Acute): 0 mg/kg bw/day Q*= .0611
 Date created/last modified: 01-02-2002/09:16:00/8 Program ver. 7.75
 Comment: Cancer dietary analysis with field trials and % CT.

RDL indices and parameters for Monte Carlo Analysis:

Index #	Dist	Parameter #1	Param #2	Param #3
1	6	almonds.rdf		
2	6	apples.rdf		
3	6	apricots.rdf		
4	6	cherries.rdf		
5	6	grapes.rdf		
6	6	nectarines.rdf		
7	6	peaches.rdf		
8	6	pears.rdf		
9	6	pecans.rdf		
10	6	tomatoes.rdf		

Note: No residue distributions have been assigned to RAC/FoodForms below

Food Code	Crop Grp	Food Name	Def Res (ppm)	Adj. Factors #1	Adj. Factors #2
40	14	Almonds	0.032000	1.000	0.200
52	11	Apples	2.620000	0.150	0.140
53	11	Apples-dried	2.620000	1.200	0.140
54	11	Apples-juice/cider	2.620000	0.015	0.140
377	11	Apples-juice-concentrate	2.620000	0.045	0.140
410	12	Apricot juice	7.940000	0.150	0.190
59	12	Apricots	7.940000	0.150	0.190
60	12	Apricots-dried	7.940000	0.900	0.190
1	13A	Blackberries	7.000000	1.000	0.010
380	13A	Blackberries-juice	7.000000	1.000	0.010
7	13B	Blueberries	2.430000	1.000	0.120
61	12	Cherries	2.710000	0.150	0.010
62	12	Cherries-dried	2.710000	0.600	0.010
63	12	Cherries-juice	2.710000	0.230	0.010
13	0	Grapes	2.640000	0.150	0.020
15	0	Grapes-juice	2.640000	0.180	0.020
392	0	Grapes-juice-concentrate	2.640000	0.540	0.020
195	0	Grapes-leaves	2.640000	0.150	0.020
14	0	Grapes-raisins	2.640000	0.300	0.020
315	0	Grapes-wine and sherry	2.640000	0.150	0.020
64	12	Nectarines	0.840000	0.150	0.150
65	12	Peaches	1.060000	0.150	0.100
66	12	Peaches-dried	1.060000	1.050	0.100
402	12	Peaches-juice	1.060000	0.150	0.100
56	11	Pears	2.690000	0.150	0.260
57	11	Pears-dried	2.690000	0.940	0.260
404	11	Pears-juice	2.690000	0.015	0.260
47	14	Pecans	0.033000	1.000	0.030
17	0	Strawberries	7.000000	1.000	0.010
416	0	Strawberries-juice	7.000000	1.000	0.010
163	8	Tomatoes-catsup	0.650000	0.080	0.010
423	8	Tomatoes-dried	0.650000	2.150	0.010
160	8	Tomatoes-juice	0.650000	0.230	0.010
162	8	Tomatoes-paste	0.650000	0.080	0.010
161	8	Tomatoes-puree	0.650000	0.045	0.010
159	8	Tomatoes-whole	0.650000	0.150	0.010

Attachment 4: Acute Analysis

Using Field Trials

U.S. Environmental Protection Agency
 DEEM ACUTE Analysis for ZIRAM
 Residue file: 1-10-02acutefieldtrials.RS7
 Analysis Date: 01-10-2002/15:26:15
 Acute Pop Adjusted Dose (aPAD) varies with population; see individual reports
 Daily totals for food and foodform consumption used.
 MC iterations = 5000 MC list in residue file MC seed = 10281
 Run Comment: "Acute dietary analysis with field trials, processing factors, and % CT."
 =====

Summary calculations (per capita):

	95th Percentile Exposure	% aPAD	99th Percentile Exposure	% aPAD	99.9th Percentile Exposure	% aPAD
U.S. Population:	0.000827	4.87	0.003541	20.83	0.011195	65.85
U.S. Population (spring season):	0.000943	5.55	0.003364	19.79	0.010642	62.60
U.S. Population (summer season):	0.000626	3.68	0.002999	17.64	0.010267	60.39
U.S. Population (autumn season):	0.000892	5.24	0.003849	22.64	0.013803	81.19
U.S. Population (winter season):	0.000904	5.32	0.003946	23.21	0.011152	65.60
Northeast region:	0.000836	4.92	0.003755	22.09	0.011802	69.43
Midwest region:	0.000959	5.64	0.003697	21.74	0.011637	68.45
Southern region:	0.000631	3.71	0.002877	16.92	0.009142	53.78
Western region:	0.001053	6.19	0.004208	24.75	0.012980	76.35
Hispanics:	0.000419	2.47	0.003049	17.93	0.010692	62.90
Non-hispanic whites:	0.000909	5.34	0.003616	21.27	0.011368	66.87
Non-hispanic blacks:	0.000495	2.91	0.003031	17.83	0.010187	59.92
Non-hisp/non-white/non-black:	0.001300	7.65	0.006014	35.38	0.011915	70.09
All infants:	0.004235	24.91	0.013203	77.66	0.029676	174.57
Nursing infants (<1 yr old):	0.000725	4.26	0.006565	38.62	0.014663	86.26
Non-nursing infants (<1 yr old):	0.005333	31.37	0.015506	91.21	0.030553	179.73
Children 1-6 yrs:	0.002327	13.69	0.009298	54.69	0.021255	125.03
Children 7-12 yrs:	0.001781	10.48	0.005488	32.28	0.012288	72.28
Females 13+ (preg/not nursing):	0.000786	4.62	0.002592	15.25	0.006291	37.00
Females 13+ (nursing):	0.001473	8.67	0.004970	29.23	0.024768	145.69
Females 13-19 (not preg or nursing):	0.000310	1.82	0.002351	13.83	0.007018	41.28
Females 20+ (not preg or nursing):	0.000717	4.21	0.002549	14.99	0.006081	35.77
Females 13-50 yrs:	0.000506	2.98	0.002375	13.97	0.006021	35.42
Males 13-19 yrs:						

	0.000355	2.09	0.002069	12.17	0.004768	28.05
Males 20+ yrs:	0.000529	3.11	0.002309	13.58	0.005708	33.57
Seniors 55+:	0.000953	5.61	0.002799	16.46	0.007160	42.12
Pacific:	0.001140	6.71	0.004423	26.02	0.013587	79.92

Using Field Trials and 0.15X washing factor

U.S. Environmental Protection Agency
 DEEM ACUTE Analysis for ZIRAM
 Residue file: 1-10-02acutefieldtrialswithwashfactor.RS7
 Adjustment factor #2 used.
 Analysis Date: 01-15-2002/09:00:18 Residue file dated: 01-10-2002/13:45:35/8
 Acute Pop Adjusted Dose (aPAD) varies with population; see individual reports
 Daily totals for food and foodform consumption used.
 MC iterations = 5000 MC list in residue file MC seed = 10281
 Run Comment: "Acute dietary analysis with field trials, processing factors, %
 CT, and the 0.15X peach washing factor used for all commodities except berries
 and nuts."
 =====

Summary calculations (per capita):

	95th Percentile		99th Percentile		99.9th Percentile	
	Exposure	% aPAD	Exposure	% aPAD	Exposure	% aPAD
U.S. Population:	0.000213	1.25	0.000852	5.01	0.002457	14.46
U.S. Population (spring season):	0.000379	2.23	0.001166	6.86	0.003257	19.16
U.S. Population (summer season):	0.000171	1.01	0.000799	4.70	0.002580	15.17
U.S. Population (autumn season):	0.000175	1.03	0.000671	3.95	0.002202	12.95
U.S. Population (winter season):	0.000183	1.08	0.000726	4.27	0.001952	11.48
Northeast region:	0.000243	1.43	0.000836	4.92	0.004368	25.69
Midwest region:	0.000254	1.49	0.001006	5.92	0.002326	13.68
Southern region:	0.000151	0.89	0.000753	4.43	0.001740	10.23
Western region:	0.000242	1.42	0.000879	5.17	0.002468	14.52
Hispanics:	0.000094	0.55	0.000633	3.72	0.001806	10.62
Non-hispanic whites:	0.000239	1.40	0.000895	5.26	0.002337	13.75
Non-hispanic blacks:	0.000133	0.78	0.000670	3.94	0.002126	12.51
Non-hisp/non-white/non-black:	0.000246	1.45	0.001403	8.25	0.010749	63.23
All infants:	0.000647	3.80	0.002000	11.77	0.004456	26.21
Nursing infants (<1 yr old):	0.000112	0.66	0.000999	5.88	0.002203	12.96
Non-nursing infants (<1 yr old):	0.000819	4.82	0.002346	13.80	0.004581	26.95
Children 1-6 yrs:	0.000479	2.82	0.001706	10.03	0.009689	57.00
Children 7-12 yrs:	0.000392	2.31	0.001069	6.29	0.003596	21.15
Females 13+ (preg/not nursing):	0.000166	0.98	0.000783	4.60	0.001192	7.01

Females 13+ (nursing):	0.000503	2.96	0.001419	8.35	0.004904	28.84
Females 13-19 (not preg or nursing):	0.000079	0.47	0.000663	3.90	0.002582	15.19
Females 20+ (not preg or nursing):	0.000201	1.18	0.000795	4.68	0.001741	10.24
Females 13-50 yrs:	0.000141	0.83	0.000717	4.22	0.001744	10.26
Males 13-19 yrs:	0.000083	0.49	0.000490	2.88	0.001201	7.06
Males 20+ yrs:	0.000130	0.76	0.000630	3.71	0.001557	9.16
Seniors 55+:	0.000248	1.46	0.000840	4.94	0.001770	10.41
Pacific:	0.000269	1.58	0.000912	5.37	0.002561	15.06

Attachment 5: Chronic Analysis

U.S. Environmental Protection Agency
 DEEM Chronic analysis for ZIRAM
 Residue file name: C:\deem\034805\Revised Analysis\1-10-02chronicfieldtrials.RS7
 Ver. 7.73
 (1989-92 data)
 Adjustment factor #2 used.

Analysis Date 01-10-2002/13:55:10 Residue file dated: 01-10-2002/13:48:57/8
 Reference dose (RfD, Chronic) = .0053 mg/kg bw/day
 COMMENT 1: Chronic dietary analysis with field trials and % CT.

=====

Total exposure by population subgroup

Population Subgroup	Total Exposure	
	mg/kg body wt/day	Percent of Rfd
U.S. Population (total)	0.000324	6.1%
U.S. Population (spring season)	0.000288	5.4%
U.S. Population (summer season)	0.000275	5.2%
U.S. Population (autumn season)	0.000388	7.3%
U.S. Population (winter season)	0.000343	6.5%
Northeast region	0.000339	6.4%
Midwest region	0.000340	6.4%
Southern region	0.000261	4.9%
Western region	0.000393	7.4%
Hispanics	0.000268	5.0%
Non-hispanic whites	0.000340	6.4%
Non-hispanic blacks	0.000239	4.5%
Non-hisp/non-white/non-black	0.000396	7.5%
All infants (< 1 year)	0.001379	26.0%
Nursing infants	0.000500	9.4%
Non-nursing infants	0.001748	33.0%
Children 1-6 yrs	0.000936	17.7%
Children 7-12 yrs	0.000567	10.7%
Females 13-19 (not preg or nursing)	0.000162	3.1%
Females 20+ (not preg or nursing)	0.000220	4.1%
Females 13-50 yrs	0.000188	3.5%
Females 13+ (preg/not nursing)	0.000271	5.1%
Females 13+ (nursing)	0.000476	9.0%
Males 13-19 yrs	0.000158	3.0%
Males 20+ yrs	0.000190	3.6%
Seniors 55+	0.000281	5.3%
Pacific Region	0.000423	8.0%

Attachment 6: Cancer Analysis*Cancer Analysis with field trials*

U.S. Environmental Protection Agency Ver. 7.73
 DEEM Chronic analysis for ZIRAM (1989-92 data)
 Residue file name: C:\deem\034805\Revised Analysis\1-10-02cancerfieldtrials.RS7
 Adjustment factor #2 used.
 Analysis Date 01-10-2002/15:16:07 Residue file dated: 01-10-2002/13:46:33/8
 Q* = 0.0611

COMMENT 1: Cancer dietary analysis with field trials and % CT.

=====

Total exposure by population subgroup

Population Subgroup	Total Exposure	
	mg/kg body wt/day	Lifetime risk (Q* = .0611)
U.S. Population (total)	0.000324	1.98E-05

Cancer Analysis with field trials and adding a 0.15X reduction factor for washing

U.S. Environmental Protection Agency Ver. 7.73
 DEEM Chronic analysis for ZIRAM (1989-92 data)
 Residue file name: C:\deem\034805\Revised Analysis\1-10-02cancerfieldtrialswithwashfactor.RS7
 Adjustment factor #2 used.
 Analysis Date 01-10-2002/15:17:09 Residue file dated: 01-10-2002/13:47:28/8
 Q* = 0.0611

COMMENT 1: Cancer dietary analysis with field trials and % CT.

=====

Total exposure by population subgroup

Population Subgroup	Total Exposure	
	mg/kg body wt/day	Lifetime risk (Q* = .0611)
U.S. Population (total)	0.000055	3.35E-06

Attachment 7: Acute Critical Commodity Contribution Analysis

Acute Analysis using Field Trials

U.S. Environmental Protection Agency
 DEEM Acute Critical Exposure Contribution Analysis (Ver 7.74)
 CSFII 1989-92
 Residue file = C:\deem\034805\Revised Analysis\1-10-02acutefieldtrials.RS7
 Acute report = C:\deem\034805\Revised Analysis\1-10-02acutefieldtrials89-92.AC7
 Date and time of analysis: 01-10-2002 14:04:44
 Daily totals for food and foodform consumption used.
 Adjustment factor #2 used.
 Minimum exposure contribution = 2%
 Monte Carlo Iterations = 5000 Seed = 10281
 CEC records generated for first 559 iterations.
 Exposures divided by body weight

Subpopulations:

- 1 U.S. Population
- 2 U.S. Population (spring season)
- 3 U.S. Population (summer season)
- 4 U.S. Population (autumn season)
- 5 U.S. Population (winter season)
- 6 Northeast region
- 7 Midwest region
- 8 Southern region
- 9 Western region
- 10 Hispanics
- 11 Non-hispanic whites
- 12 Non-hispanic blacks
- 13 Non-hisp/non-white/non-black
- 14 All infants
- 15 Nursing infants (<1 yr old)
- 16 Non-nursing infants (<1 yr old)
- 17 Children 1-6 yrs
- 18 Children 7-12 yrs
- 19 Females 13+ (preg/not nursing)
- 20 Females 13+ (nursing)
- 21 Females 13-19 (not preg or nursing)
- 22 Females 20+ (not preg or nursing)
- 23 Females 13-50 yrs
- 24 Males 13-19 yrs
- 25 Males 20+ yrs
- 26 Seniors 55+
- 27 Pacific

=====

U.S. Population

Low percentile for CEC records: 99.9 Exposure (mg/day) = 0.011195
 High percentile for CEC records: 100 Exposure (mg/day) = 0.100111
 Number of actual records in this interval: 20630

Critical foods/foodforms for this population (as derived from these records):

N=number of appearances in all records (including duplicates)

%=percent of total exposure for all records (including duplicates)

Food	FF	N	Percent	Food Name
52	14	4154	18.04%	Apples-Boiled
52	11	4498	15.78%	Apples-Uncooked
56	11	2595	13.19%	Pears-Uncooked
56	31	2612	10.96%	Pears-Canned: NFS
60	18	1929	9.00%	Apricots-dried-Dried
52	31	1677	5.92%	Apples-Canned: NFS

=====

All infants

Low percentile for CEC records: 99.9 Exposure (mg/day) = 0.029677
 High percentile for CEC records: 100 Exposure (mg/day) = 0.058028
 Number of actual records in this interval: 310

Critical foods/foodforms for this population (as derived from these records):

N=number of appearances in all records (including duplicates)

%=percent of total exposure for all records (including duplicates)

Food	FF	N	Percent	Food Name
59	31	104	30.52%	Apricots-Canned: NFS
56	31	100	27.63%	Pears-Canned: NFS
52	31	116	21.67%	Apples-Canned: NFS
56	11	34	9.86%	Pears-Uncooked
65	31	28	8.97%	Peaches-Canned: NFS

=====

Children 1-6 yrs

Low percentile for CEC records: 99.9 Exposure (mg/day) = 0.021255
 High percentile for CEC records: 100 Exposure (mg/day) = 0.100111
 Number of actual records in this interval: 1912

Critical foods/foodforms for this population (as derived from these records):

N=number of appearances in all records (including duplicates)

%=percent of total exposure for all records (including duplicates)

Food	FF	N	Percent	Food Name
56	11	514	30.68%	Pears-Uncooked
52	14	588	27.02%	Apples-Boiled
60	18	290	10.47%	Apricots-dried-Dried
52	11	208	6.43%	Apples-Uncooked

=====

Children 7-12 yrs

Low percentile for CEC records: 99.9 Exposure (mg/day) = 0.012288
 High percentile for CEC records: 100 Exposure (mg/day) = 0.031806
 Number of actual records in this interval: 1888

Critical foods/foodforms for this population (as derived from these records):

N=number of appearances in all records (including duplicates)

%=percent of total exposure for all records (including duplicates)

Food	FF	N	Percent	Food Name
52	11	586	24.27%	Apples-Uncooked
52	14	445	23.70%	Apples-Boiled
60	18	450	22.40%	Apricots-dried-Dried
56	12	327	13.30%	Pears-Cooked: NFS
56	11	180	6.53%	Pears-Uncooked

=====

Females 13-50 yrs

Low percentile for CEC records: 99.9 Exposure (mg/day) = 0.006021
 High percentile for CEC records: 100 Exposure (mg/day) = 0.060871
 Number of actual records in this interval: 5929

Critical foods/foodforms for this population (as derived from these records):

N=number of appearances in all records (including duplicates)

%=percent of total exposure for all records (including duplicates)

Food	FF	N	Percent	Food Name
------	----	---	---------	-----------

60	18	749	20.37%	Apricots-dried-Dried
56	11	1321	15.86%	Pears-Uncooked
53	18	1278	15.69%	Apples-dried-Dried
52	11	968	10.26%	Apples-Uncooked
57	18	400	9.85%	Pears-dried-Dried
53	14	559	6.31%	Apples-dried-Boiled

=====

Males 13-19 yrs

Low percentile for CEC records: 99.9 Exposure (mg/day) = 0.004768

High percentile for CEC records: 100 Exposure (mg/day) = 0.019496

Number of actual records in this interval: 1598

Critical foods/foodforms for this population (as derived from these records):

N=number of appearances in all records (including duplicates)

%=percent of total exposure for all records (including duplicates)

Food	FF	N	Percent	Food Name
56	11	510	28.26%	Pears-Uncooked
52	14	382	26.33%	Apples-Boiled
52	11	500	23.59%	Apples-Uncooked
56	12	153	5.36%	Pears-Cooked: NFS

=====

Males 20+ yrs

Low percentile for CEC records: 99.9 Exposure (mg/day) = 0.005708

High percentile for CEC records: 100 Exposure (mg/day) = 0.063688

Number of actual records in this interval: 4705

Critical foods/foodforms for this population (as derived from these records):

N=number of appearances in all records (including duplicates)

%=percent of total exposure for all records (including duplicates)

Food	FF	N	Percent	Food Name
60	18	1013	22.66%	Apricots-dried-Dried
52	11	1004	13.78%	Apples-Uncooked
410	11	568	13.20%	Apricot juice-Uncooked
56	11	671	11.26%	Pears-Uncooked
57	18	809	8.59%	Pears-dried-Dried
52	14	380	5.87%	Apples-Boiled
53	18	1065	5.58%	Apples-dried-Dried

=====

Seniors 55+

Low percentile for CEC records: 99.9 Exposure (mg/day) = 0.007160

High percentile for CEC records: 100 Exposure (mg/day) = 0.033588

Number of actual records in this interval: 3370

Critical foods/foodforms for this population (as derived from these records):

N=number of appearances in all records (including duplicates)

%=percent of total exposure for all records (including duplicates)

Food	FF	N	Percent	Food Name
410	11	922	28.05%	Apricot juice-Uncooked
56	11	518	11.85%	Pears-Uncooked
60	14	223	9.32%	Apricots-dried-Boiled
60	18	367	9.03%	Apricots-dried-Dried
57	14	251	7.70%	Pears-dried-Boiled
59	12	297	6.74%	Apricots-Cooked: NFS
52	11	300	5.37%	Apples-Uncooked
56	12	241	5.11%	Pears-Cooked: NFS

Acute Analysis using Field Trials and the 0.15X Washing Factor

U.S. Environmental Protection Agency
 DEEM Acute Critical Exposure Contribution Analysis (Ver 7.74)
 CSFII 1989-92
 Residue file = C:\deem\034805\Revised Analysis\1-10-02acutefieldtrialswithwashfactor.RS7
 Acute report = C:\deem\034805\Revised Analysis\1-10-02acutefieldtrialswithwashfactor89-92.AC7
 Date and time of analysis: 01-15-2002 07:44:19
 Daily totals for food and foodform consumption used.
 Adjustment factor #2 used.
 Minimum exposure contribution = 2%
 Monte Carlo Iterations = 5000 Seed = 10281
 CEC records generated for first 559 iterations.
 Exposures divided by body weight

Subpopulations:

- 1 U.S. Population
- 2 U.S. Population (spring season)
- 3 U.S. Population (summer season)
- 4 U.S. Population (autumn season)
- 5 U.S. Population (winter season)
- 6 Northeast region
- 7 Midwest region
- 8 Southern region
- 9 Western region
- 10 Hispanics
- 11 Non-hispanic whites
- 12 Non-hispanic blacks
- 13 Non-hisp/non-white/non-black
- 14 All infants
- 15 Nursing infants (<1 yr old)
- 16 Non-nursing infants (<1 yr old)
- 17 Children 1-6 yrs
- 18 Children 7-12 yrs
- 19 Females 13+ (preg/not nursing)
- 20 Females 13+ (nursing)
- 21 Females 13-19 (not preg or nursing)
- 22 Females 20+ (not preg or nursing)
- 23 Females 13-50 yrs
- 24 Males 13-19 yrs
- 25 Males 20+ yrs
- 26 Seniors 55+
- 27 Pacific

=====

U.S. Population

Low percentile for CEC records: 99.9 Exposure (mg/day) = 0.002457
 High percentile for CEC records: 100 Exposure (mg/day) = 0.015350
 Number of actual records in this interval: 19737

Critical foods/foodforms for this population (as derived from these records):

N=number of appearances in all records (including duplicates)

%=percent of total exposure for all records (including duplicates)

Food	FF	N	Percent	Food Name
17	11	6376	36.78%	Strawberries-Uncooked
416	11	2795	17.13%	Strawberries-juice-Uncooked
52	14	1782	6.30%	Apples-Boiled
56	11	1335	5.55%	Pears-Uncooked

=====

All infants

Low percentile for CEC records: 99.9 Exposure (mg/day) = 0.004456
 High percentile for CEC records: 100 Exposure (mg/day) = 0.008704
 Number of actual records in this interval: 310

Critical foods/foodforms for this population (as derived from these records):

N=number of appearances in all records (including duplicates)

%=percent of total exposure for all records (including duplicates)

Food	FF	N	Percent	Food Name
59	31	104	30.50%	Apricots-Canned: NFS
56	31	100	27.59%	Pears-Canned: NFS
52	31	116	21.66%	Apples-Canned: NFS
56	11	34	9.86%	Pears-Uncooked
65	31	28	8.97%	Peaches-Canned: NFS

Children 1-6 yrs

Low percentile for CEC records: 99.9 Exposure (mg/day) = 0.009689

High percentile for CEC records: 100 Exposure (mg/day) = 0.015350

Number of actual records in this interval: 758

Critical foods/foodforms for this population (as derived from these records):

N=number of appearances in all records (including duplicates)

%=percent of total exposure for all records (including duplicates)

Food	FF	N	Percent	Food Name
17	11	675	87.53%	Strawberries-Uncooked
56	11	39	5.91%	Pears-Uncooked

Children 7-12 yrs

Low percentile for CEC records: 99.9 Exposure (mg/day) = 0.003596

High percentile for CEC records: 100 Exposure (mg/day) = 0.008555

Number of actual records in this interval: 2007

Critical foods/foodforms for this population (as derived from these records):

N=number of appearances in all records (including duplicates)

%=percent of total exposure for all records (including duplicates)

Food	FF	N	Percent	Food Name
416	11	1118	51.67%	Strawberries-juice-Uncooked
17	11	588	34.10%	Strawberries-Uncooked

Females 13-50 yrs

Low percentile for CEC records: 99.9 Exposure (mg/day) = 0.001744

High percentile for CEC records: 100 Exposure (mg/day) = 0.012564

Number of actual records in this interval: 4582

Critical foods/foodforms for this population (as derived from these records):

N=number of appearances in all records (including duplicates)

%=percent of total exposure for all records (including duplicates)

Food	FF	N	Percent	Food Name
17	11	2846	51.52%	Strawberries-Uncooked
60	18	367	11.77%	Apricots-dried-Dried
7	41	445	8.26%	Blueberries-Frozen: NFS
57	18	242	6.62%	Pears-dried-Dried
53	18	559	6.08%	Apples-dried-Dried
17	41	559	5.40%	Strawberries-Frozen: NFS

Males 13-19 yrs

Low percentile for CEC records: 99.9 Exposure (mg/day) = 0.001201

High percentile for CEC records: 100 Exposure (mg/day) = 0.003504
 Number of actual records in this interval: 965

Critical foods/foodforms for this population (as derived from these records):
 N=number of appearances in all records (including duplicates)
 %=percent of total exposure for all records (including duplicates)

Food	FF	N	Percent	Food Name
17	11	563	49.52%	Strawberries-Uncooked
7	13	112	13.95%	Blueberries-Baked
52	14	86	11.72%	Apples-Boiled
56	11	85	6.46%	Pears-Uncooked
7	41	65	5.07%	Blueberries-Frozen: NFS

=====

Males 20+ yrs

Low percentile for CEC records: 99.9 Exposure (mg/day) = 0.001557
 High percentile for CEC records: 100 Exposure (mg/day) = 0.009768
 Number of actual records in this interval: 5975

Critical foods/foodforms for this population (as derived from these records):
 N=number of appearances in all records (including duplicates)
 %=percent of total exposure for all records (including duplicates)

Food	FF	N	Percent	Food Name
17	11	3636	59.04%	Strawberries-Uncooked
416	11	559	7.50%	Strawberries-juice-Uncooked
60	18	407	6.47%	Apricots-dried-Dried
7	11	360	6.43%	Blueberries-Uncooked

=====

Seniors 55+

Low percentile for CEC records: 99.9 Exposure (mg/day) = 0.001771
 High percentile for CEC records: 100 Exposure (mg/day) = 0.005865
 Number of actual records in this interval: 4196

Critical foods/foodforms for this population (as derived from these records):
 N=number of appearances in all records (including duplicates)
 %=percent of total exposure for all records (including duplicates)

Food	FF	N	Percent	Food Name
17	11	2775	63.20%	Strawberries-Uncooked
7	13	372	9.35%	Blueberries-Baked
410	11	430	8.40%	Apricot juice-Uncooked

Attachment 8: Chronic Critical Commodity Contribution Analysis

U.S. Environmental Protection Agency
 DEEM Chronic analysis for ZIRAM
 Residue file name: C:\deem\034805\Revised Analysis\1-10-02chronicfieldtrials.RS7
 Ver. 7.73
 (1989-92 data)
 Adjustment factor #2 used.

Analysis Date 01-10-2002/13:55:13 Residue file dated: 01-10-2002/13:48:57/8
 Reference dose (RfD, Chronic) = .0053 mg/kg bw/day
 COMMENT 1: Chronic dietary analysis with field trials and % CT.

=====

Critical Commodity Contribution Analysis for
 U.S. Population (total)

Total Exposure = .0003236 mg/kg bw/day

Crop groups with total exposure contribution > 5%
 Foods/Foodforms with exposure contribution > 2%

Crop group Food Foodform	-----Exposure Analysis-----		
	mg/kg body wt/day	% of Total Exposure	Percent of RfD

Crop Group = (0) Other			
Grapes-juice	0.0000085	2.64%	0.16%

Total for crop group	0.0000262	8.09%	0.49%

Crop Group = (11) Pome Fruits			
Apples	0.0001620	50.08%	3.06%
Apples-juice/cider	0.0000158	4.90%	0.30%
Pears	0.0000545	16.83%	1.03%

Total for crop group	0.0002441	75.43%	4.61%

Crop Group = (12) Stone Fruits			
Apricots	0.0000157	4.85%	0.30%
Apricots-dried	0.0000104	3.23%	0.20%
Peaches	0.0000133	4.12%	0.25%

Total for crop group	0.0000453	13.99%	0.85%

Total for crop groups listed above:	0.0003155	97.51%	6.0%

=====

Critical Commodity Contribution Analysis for
 All infants (< 1 year)

Total Exposure = .0013786 mg/kg bw/day

Crop groups with total exposure contribution > 5%
 Foods/Foodforms with exposure contribution > 2%

Crop group Food Foodform	-----Exposure Analysis-----		
	mg/kg body wt/day	% of Total Exposure	Percent of RfD

Crop Group = (0) Other			
Grapes-juice-concentrate	0.0000512	3.71%	0.97%

Total for crop group	0.0000720	5.23%	1.36%

Crop Group = (11) Pome Fruits			
Apples	0.0005206	37.76%	9.82%

Pears	0.0003771	27.35%	7.11%
Apples-juice-concentrate	0.0000814	5.91%	1.54%
Pears-juice	0.0000981	7.12%	1.85%

Total for crop group	0.0011010	79.86%	20.77%
Crop Group = (12) Stone Fruits			
Apricots	0.0000993	7.20%	1.87%
Peaches	0.0000936	6.79%	1.77%

Total for crop group	0.0001996	14.48%	3.77%
Total for crop groups listed above:	0.0013726	99.57%	25.9%

=====

Critical Commodity Contribution Analysis for
Children 1-6 yrs

Total Exposure = .0009362 mg/kg bw/day

Crop groups with total exposure contribution > 5%
Foods/Foodforms with exposure contribution > 2%

Crop group Food Foodform	-----Exposure Analysis-----		
	mg/kg body wt/day	% of Total Exposure	Percent of Rfd

Crop Group = (0) Other			
Grapes-juice	0.0000532	5.68%	1.00%

Total for crop group	0.0000912	9.75%	1.72%
Crop Group = (11) Pome Fruits			
Apples	0.0004643	49.60%	8.76%
Apples-juice/cider	0.0001000	10.68%	1.89%
Pears	0.0001344	14.35%	2.54%

Total for crop group	0.0007207	76.98%	13.60%
Crop Group = (12) Stone Fruits			
Apricots	0.0000452	4.83%	0.85%
Apricots-dried	0.0000229	2.44%	0.43%
Peaches	0.0000360	3.85%	0.68%

Total for crop group	0.0001100	11.75%	2.08%
Total for crop groups listed above:	0.0009220	98.47%	17.4%

=====

Critical Commodity Contribution Analysis for
Children 7-12 yrs

Total Exposure = .0005674 mg/kg bw/day

Crop groups with total exposure contribution > 5%
Foods/Foodforms with exposure contribution > 2%

Crop group Food Foodform	-----Exposure Analysis-----		
	mg/kg body wt/day	% of Total Exposure	Percent of Rfd

Crop Group = (11) Pome Fruits			
Apples	0.0003222	56.79%	6.08%
Apples-juice/cider	0.0000245	4.33%	0.46%
Pears	0.0001070	18.87%	2.02%

Total for crop group	0.0004658	82.11%	8.79%
Crop Group = (12) Stone Fruits			
Apricots	0.0000241	4.24%	0.45%
Apricots-dried	0.0000117	2.07%	0.22%
Peaches	0.0000237	4.18%	0.45%

Total for crop group	0.0000625	11.02%	1.18%
Total for crop groups listed above:	0.0005284	93.13%	10.0%

=====

Critical Commodity Contribution Analysis for
Females 13-50 yrs

Total Exposure = .0001878 mg/kg bw/day

Crop groups with total exposure contribution > 5%
Foods/Foodforms with exposure contribution > 2%

Crop group Food Foodform	-----Exposure Analysis-----		
	mg/kg body wt/day	% of Total Exposure	Percent of RfD

Crop Group = (0) Other			
Grapes-juice	0.0000038	2.04%	0.07%
Grapes-wine and sherry	0.0000067	3.56%	0.13%

Total for crop group	0.0000197	10.49%	0.37%
Crop Group = (11) Pome Fruits			
Apples	0.0000951	50.67%	1.80%
Apples-juice/cider	0.0000057	3.06%	0.11%
Pears	0.0000293	15.58%	0.55%

Total for crop group	0.0001364	72.64%	2.57%
Crop Group = (12) Stone Fruits			
Apricots	0.0000060	3.20%	0.11%
Apricots-dried	0.0000074	3.96%	0.14%
Peaches	0.0000068	3.63%	0.13%

Total for crop group	0.0000252	13.40%	0.47%
Total for crop groups listed above:	0.0001812	96.53%	3.4%

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Critical Commodity Contribution Analysis for
Males 13-19 yrs

Total Exposure = .000158 mg/kg bw/day

Crop groups with total exposure contribution > 5%
Foods/Foodforms with exposure contribution > 2%

Crop group Food Foodform	-----Exposure Analysis-----		
	mg/kg body wt/day	% of Total Exposure	Percent of RfD

Crop Group = (0) Other			
Grapes-juice	0.0000035	2.24%	0.07%
-----	-----	-----	-----
Total for crop group	0.0000097	6.12%	0.18%
Crop Group = (11) Pome Fruits			
Apples	0.0000910	57.59%	1.72%
Apples-juice/cider	0.0000063	4.00%	0.12%
Pears	0.0000146	9.21%	0.27%
Pears-dried	0.0000044	2.80%	0.08%
-----	-----	-----	-----
Total for crop group	0.0001196	75.66%	2.26%
Crop Group = (12) Stone Fruits			
Apricots	0.0000061	3.85%	0.11%
Apricots-dried	0.0000044	2.76%	0.08%
Peaches	0.0000065	4.12%	0.12%
-----	-----	-----	-----
Total for crop group	0.0000195	12.36%	0.37%
Crop Group = (13) Berries			
Blueberries	0.0000054	3.40%	0.10%
-----	-----	-----	-----
Total for crop group	0.0000055	3.45%	0.10%
Crop Group = (13B) Berries: Bushberry Group			
Blueberries	0.0000054	3.40%	0.10%
-----	-----	-----	-----
Total for crop group	0.0000054	3.40%	0.10%
Total for crop groups listed above:	0.0001542	97.59%	2.9%

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Critical Commodity Contribution Analysis for
Males 20+ yrs

Total Exposure = .0001901 mg/kg bw/day

Crop groups with total exposure contribution > 5%
Foods/Foodforms with exposure contribution > 2%

Crop group Food Foodform	-----Exposure Analysis-----		
	mg/kg body wt/day	% of Total Exposure	Percent of Rfd
-----	-----	-----	-----
Crop Group = (0) Other			
Grapes-wine and sherry	0.0000059	3.11%	0.11%
-----	-----	-----	-----
Total for crop group	0.0000152	7.99%	0.29%
Crop Group = (11) Pome Fruits			
Apples	0.0000953	50.13%	1.80%
Apples-dried	0.0000049	2.60%	0.09%
Pears	0.0000297	15.63%	0.56%
-----	-----	-----	-----
Total for crop group	0.0001367	71.92%	2.58%
Crop Group = (12) Stone Fruits			
Apricots	0.0000089	4.70%	0.17%
Apricots-dried	0.0000093	4.88%	0.18%
Peaches	0.0000067	3.55%	0.13%
-----	-----	-----	-----
Total for crop group	0.0000309	16.26%	0.58%
Total for crop groups listed above:	0.0001828	96.16%	3.4%

Critical Commodity Contribution Analysis for
Seniors 55+

Total Exposure = .0002809 mg/kg bw/day

Crop groups with total exposure contribution > 5%
Foods/Foodforms with exposure contribution > 2%

Crop group Food Foodform	-----Exposure Analysis-----		
	mg/kg body wt/day	% of Total Exposure	Percent of RfD
Crop Group = (0) Other			
Grapes-wine and sherry	0.0000060	2.13%	0.11%
Total for crop group	0.0000193	6.87%	0.36%
Crop Group = (11) Pome Fruits			
Apples	0.0001219	43.41%	2.30%
Pears	0.0000542	19.28%	1.02%
Total for crop group	0.0001911	68.01%	3.60%
Crop Group = (12) Stone Fruits			
Apricots	0.0000197	7.00%	0.37%
Apricots-dried	0.0000185	6.57%	0.35%
Peaches	0.0000142	5.06%	0.27%
Apricot juice	0.0000086	3.06%	0.16%
Total for crop group	0.0000638	22.70%	1.20%
Total for crop groups listed above:	0.0002741	97.58%	5.2%

Attachment 9: Cancer Critical Commodity Contribution Analysis

Using Field Trials

U.S. Environmental Protection Agency
 DEEM Chronic analysis for ZIRAM
 Residue file name: C:\deem\034805\Revised Analysis\1-10-02cancerfieldtrials.RS7
 Ver. 7.73
 (1989-92 data)
 Adjustment factor #2 used.
 Analysis Date 01-10-2002/15:16:11 Residue file dated: 01-10-2002/13:46:33/8
 Q* = 0.0611

COMMENT 1: Cancer dietary analysis with field trials and % CT.

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Critical Commodity Contribution Analysis for
 U.S. Population (total)

Total Exposure = .0003236 mg/kg bw/day

Crop groups with total exposure contribution > 5%
 Foods/Foodforms with exposure contribution > 2%

Crop group Food Foodform	-----Exposure analysis-----		
	mg/kg body wt/day	% of Total Exposure	Lifetime Risk (Q* = .0611)

Crop Group = (0) Other			
Grapes-juice	0.0000085	2.64%	5.22E-07

Total for crop group	0.0000262	8.09%	1.60E-06

Crop Group = (11) Pome Fruits			
Apples	0.0001620	50.08%	9.90E-06
Apples-juice/cider	0.0000158	4.90%	9.68E-07
Pears	0.0000545	16.83%	3.33E-06

Total for crop group	0.0002441	75.43%	1.49E-05

Crop Group = (12) Stone Fruits			
Apricots	0.0000157	4.85%	9.59E-07
Apricots-dried	0.0000104	3.23%	6.38E-07
Peaches	0.0000133	4.12%	8.15E-07

Total for crop group	0.0000453	13.99%	2.77E-06

Total for crop groups listed above:	0.0003155	97.51%	1.93E-05

Using Field Trials and 0.15X washing factor

U.S. Environmental Protection Agency
 DEEM Chronic analysis for ZIRAM
 Residue file name: C:\deem\034805\Revised Analysis\1-10-02cancerfieldtrialswithwashfactor.RS7
 Ver. 7.73
 (1989-92 data)
 Adjustment factor #2 used.

Analysis Date 01-10-2002/15:17:13 Residue file dated: 01-10-2002/13:47:28/8
 Q* = 0.0611

COMMENT 1: Cancer dietary analysis with field trials and % CT.

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Critical Commodity Contribution Analysis for
 U.S. Population (total)

Total Exposure = .0000549 mg/kg bw/day

Crop groups with total exposure contribution > 5%
 Foods/Foodforms with exposure contribution > 2%

Crop group Food Foodform	-----Exposure analysis-----		
	mg/kg body wt/day	% of Total Exposure	Lifetime Risk (Q* = .0611)

Crop Group = (0) Other			
Grapes-juice	0.0000013	2.34%	7.84E-08
Strawberries	0.0000033	6.06%	2.03E-07

Total for crop group	0.0000069	12.50%	4.19E-07

Crop Group = (11) Pome Fruits			
Apples	0.0000243	44.28%	1.49E-06
Apples-juice/cider	0.0000024	4.33%	1.45E-07
Pears	0.0000082	14.88%	4.99E-07

Total for crop group	0.0000366	66.69%	2.24E-06

Crop Group = (12) Stone Fruits			
Apricots	0.0000024	4.29%	1.44E-07
Apricots-dried	0.0000016	2.85%	9.57E-08
Peaches	0.0000020	3.64%	1.22E-07

Total for crop group	0.0000068	12.37%	4.15E-07

Crop Group = (13) Berries			
Blueberries	0.0000038	6.89%	2.31E-07

Total for crop group	0.0000040	7.28%	2.44E-07

Crop Group = (13B) Berries: Bushberry Group			
Blueberries	0.0000038	6.89%	2.31E-07

Total for crop group	0.0000038	6.89%	2.31E-07

Total for crop groups listed above:	0.0000543	98.84%	3.32E-06



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R161460

Chemical Name: Ziram

PC Code: 034805

HED File Code:

Memo Date: 1/16/2002

File ID: 00000000

Accession #: 000-00-0126

HED Records Reference Center

2/3/2009